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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference K-84CARBIDE	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/JP2003/012873	International filing date (day/month/year) 08 October 2003 (08.10.2003)	Priority date (day/month/year) 08 October 2002 (08.10.2002)
International Patent Classification (IPC) or national classification and IPC G09F 13/16, 13/22, G02B 5/128		
Applicant NIPPON CARBIDE KOGYO KABUSHIKI KAISHA		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>18</u> sheets, including this cover sheet. <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of _____ sheets.
3. This report contains indications relating to the following items: I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input checked="" type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input checked="" type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 08 October 2003 (08.10.2003)	Date of completion of this report 18 May 2004 (18.05.2004)
Name and mailing address of the IPEA/JP Facsimile No.	Authorized officer Telephone No.

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I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the drawings:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☒ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☒ not complied with for the following reasons:

SEE SUPPLEMENTAL SHEET

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
- ☐ the parts relating to claims Nos. _____

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: IV. 3.

The common feature of claims 1 to 36 is "a retroreflective display device comprising a front surface protective layer, an information display layer, a retroreflective layer, and a rear surface protective layer, characterized in that one or more electromagnetic wave recognition devices having a built-in electromagnetic wave recognition-type integrated circuit is/are provided in between each layer or in between any two given layers, and one or more telecommunications antennas connected to said electromagnetic wave recognition-type integrated circuit(s) are also provided."

However, "a retroreflective display device" that includes "an information display layer and a retroreflective layer" and "is characterized in that one or more electromagnetic wave recognition devices having a built-in electromagnetic wave recognition-type integrated circuit is/are provided in between each layer or in between any two given layers, and one or more telecommunications antennas connected to said electromagnetic wave recognition-type integrated circuit(s) are also provided," is disclosed in document US 5608391 A (Minnesota Mining and Manufacturing Company, 4 March 1997, entire text, fig. 8-9b). Further, providing a protective layer in a display device is a widely performed technique.

Thus, the "common feature of claims 1 to 36" does not go beyond the prior art, and therefore, this common

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: IV. 3.

feature does not constitute a special technical feature as defined in the second sentence of PCT Rule 13.2.

Consequently, there is no feature common to all claims. Because there is no other common feature that can be considered a special technical feature as defined in the second sentence of PCT Rule 13.2, no technical relationship as defined in PCT Rule 13 can be found among the different inventions described in the claims.

Therefore, claims 1 to 36 clearly do not fulfill the requirement of unity of invention.

Further, claims 1 to 36 can be categorized as follows.

The special technical feature common to claims 1 to 3 is "a retroreflective display device wherein the position at which a communications antenna is provided is specified," and the inventions described in said claims form a group of inventions so linked as to form a single general inventive concept.

The special technical feature common to claims 4 to 13 is "a retroreflective display device wherein a retroreflective element is specified," and the inventions described in said claims form a group of inventions so linked as to form a single general inventive concept.

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: IV. 3.

The special technical feature common to claims 14 and 15 is "a retroreflective display device wherein at least two electromagnetic wave recognition devices are provided," and the inventions described in said claims form a group of inventions so linked as to form a single general inventive concept.

The special technical feature common to claims 16 to 18 is "an internally illuminated retroreflective display device provided with an electromagnetic wave recognition device and having an internally illuminated indicator structure comprising a rectangular body that encloses and retains a front surface protective layer, an information-retaining layer, a retroreflective layer, a rear surface protective layer, the electromagnetic wave recognition device, and an illumination device, characterized in that the illumination device is provided on the rear surface of the retroreflective layer, and the retroreflective layer is retroreflective of light entering from the front surface of the indicator structure but optically transparent to light from the interior of the indicator structure, wherein the position at which a communications antenna is provided is specified," and the inventions described in said claims form a group of inventions so linked as to form a single general inventive concept.

The special technical feature common to claims 19 to 25 is "an internally illuminated retroreflective display device provided with an electromagnetic wave

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: IV. 3.

recognition device and having an internally illuminated indicator structure comprising a rectangular body that encloses and retains a front surface protective layer, an information-retaining layer, a retroreflective layer, a rear surface protective layer, the electromagnetic wave recognition device, and an illumination device, characterized in that the illumination device is provided on the rear surface of the retroreflective layer, and the retroreflective layer is retroreflective of light entering from the front surface of the indicator structure but optically transparent to light from the interior of the indicator structure, wherein a retroreflective element is specified," and the inventions described in said claims form a group of inventions so linked as to form a single general inventive concept.

The special technical feature of claim 26 is "an internally illuminated retroreflective display device provided with an electromagnetic wave recognition device and having an internally illuminated indicator structure comprising a rectangular body that encloses and retains a front surface protective layer, an information-retaining layer, a retroreflective layer, a rear surface protective layer, the electromagnetic wave recognition device, and an illumination device, characterized in that the illumination device is provided on the rear surface of the retroreflective layer, and the retroreflective layer is retroreflective of light entering from the front surface of the indicator structure but optically transparent to light from the interior of the indicator structure, wherein the structure of the illumination

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: IV. 3.

device is specified," and the inventions described in said claim form a group of inventions so linked as to form a single general inventive concept.

The special technical feature common to claims 27 to 29 is "an electroluminescent-type internally illuminated retroreflective display device provided with an electromagnetic wave recognition device, characterized in that an illumination device that uses the principle of electroluminescence is provided on the rear surface of a retroreflective layer, and the retroreflective layer is retroreflective of light entering from the front surface of the indicator structure but optically transparent to light from the interior of the indicator structure, wherein the position at which a communications antenna is provided is specified," and the inventions described in said claims form a group of inventions so linked as to form a single general inventive concept.

The special technical feature common to claims 30 to 36 is "an electroluminescent-type internally illuminated retroreflective display device provided with an electromagnetic wave recognition device, characterized in that an illumination device that uses the principle of electroluminescence is provided on the rear surface of a retroreflective layer, and the retroreflective layer is retroreflective of light entering from the front surface of the indicator structure but optically transparent to light from the interior of the indicator structure, wherein the retroreflective element is specified," and the inventions described in said claims form a group of

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Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: IV. 3.

inventions so linked as to form a single general
inventive concept.

Therefore, claims 1 to 36 can be categorized into
eight separate inventions.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-36	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-36	NO
Industrial applicability (IA)	Claims	1-36	YES
	Claims		NO

2. Citations and explanations

Document 1: US 5621571 A (Minnesota Mining and Manufacturing Company), 15 April 1997

Document 2: JP 8-43615 A (Nippon Carbide Industries Co., Ltd.), 16 February 1996

Document 3: JP 2001-151313 A (Toppan Printing Co., Ltd.), 5 June 2001

Document 4: US 6441551 B1 (3M Innovative Properties Company), 27 August 2002

Document 5: JP 2001-33609 A (Nippon Carbide Industries Co., Ltd.), 9 February 2001

Claim 1

The invention described in claim 1 does not involve an inventive step in the light of document 1 cited in the international search report. The invention described in claim 1 differs from the invention disclosed in document 1 only in the provision of a protective layer, but the provision of a protective layer in a display device is merely standard practice.

Claims 2 and 3

The invention described in claims 2 and 3 does not involve an inventive step in the light of document 1.

Document 1 discloses the formation of an antenna on the

rear surface of the reflective surface of a retroreflective element (fig. 1b), and the formation of an antenna on the reflective surface of a retroreflective element (fig. 9b).

Claims 4 and 5

The invention described in claims 4 and 5 does not involve an inventive step in the light of document 1. Document 1 discloses the use of cube-corner prism-type retroreflective elements (fig. 4, fig. 4a), and a prism-type retroreflective sheet that provides total reflection (column 5, lines 66 and 67).

Claim 6

The invention described in claim 6 does not involve an inventive step in the light of document 1. Document 1 (column 6, lines 7 to 10) discloses the vapor-coating of a prism-type retroreflective sheet.

Claim 7

The invention described in claim 7 does not involve an inventive step in the light of document 1. Document 1 (fig. 2, 6) discloses the use of glass microsphere-type retroreflective elements.

Claim 8

The invention described in claim 8 does not involve an inventive step in the light of document 1. Document 1 (fig. 2, 6, column 5, lines 33 to 48) discloses the formation of a reflective coating of vapor-deposited aluminum.

Claim 9

The invention described in claim 9 does not involve an inventive step in the light of document 1. Document 1

(fig. 2, column 5, lines 37 to 40) discloses the provision of a spacer layer in between microspheres and a reflective coating. Further, as disclosed in document 2 (column 5, lines 13 to 15) cited in the international search report for example, making the spacer layer of a resin does not pose any particular technical difficulty.

Claims 10 to 13

The invention described in claims 10 to 13 does not involve an inventive step in the light of document 1. Document 1 (column 6, line 51 to column 7, line 4) discloses the use of a retroreflective sheet having a discontinuous vapor coat layer.

Claims 14 and 15

The invention described in claims 14 and 15 does not involve an inventive step in the light of document 1 and document 3 cited in the international search report. Document 3 (column 6, line 41 to column 7, line 22; column 8, lines 5 to 8) discloses the mounting of an antenna that transmits electromagnetic waves at a plurality of frequencies on a metal object such as a license plate, and a person skilled in the art could easily conceive of constituting the device disclosed in document 1 in the same manner.

Claim 16

The invention described in claim 16 does not involve an inventive step in the light of document 1 and document 4 cited in the international search report. The invention described in claim 16 differs from the invention disclosed in document 1 in the provision of a protective layer, but the provision of a protective layer in a display device is merely standard practice. Further, the invention described in claim 16 also differs from the invention disclosed in

document 1 in the arranging of an illumination device on the rear surface of a retroreflective layer, but document 4 (column 11, line 45 to column 12, line 22, fig. 4) discloses the arranging of an illumination device on the rear surface of a retroreflective layer, and a person skilled in the art could easily conceive of constituting the invention disclosed in document 1 in the same manner.

Claims 17 and 18

The invention described in claims 17 and 18 does not involve an inventive step in the light of documents 1 and 4, for the reasons indicated in the comments pertaining to claims 2 and 3 and claim 16.

Claims 19 and 20

The invention described in claims 19 and 20 does not involve an inventive step in the light of documents 1 and 4, for the reasons indicated in the comments pertaining to claims 4 and 5 and claim 16.

Claim 21

The invention described in claim 21 does not involve an inventive step in the light of documents 1 and 4, for the reasons indicated in the comments pertaining to claim 6 and claim 16. Further, the feature wherein the percentage of area covered by a metallic thin-film layer is set to less than 80% is merely a feature at which a person skilled in the art could arrive through a conventional process of trial and error.

Claim 22

The invention described in claim 22 does not involve an inventive step in the light of documents 1 and 4. Cube-corner prism-type retroreflective elements such as triangular pyramid-type cube-corner elements or full cube-

type cube-corner elements are merely conventionally known elements, as disclosed in document 5 cited in the international search report.

Claim 23

The invention described in claim 23 does not involve an inventive step in the light of documents 1 and 4, for the reasons indicated in the comments pertaining to claim 7 and claim 16.

Claim 24

The invention described in claim 24 does not involve an inventive step in the light of documents 1 and 4, for the reasons indicated in the comments pertaining to claim 8 and claim 16. Further, the feature wherein the percentage of area covered by a metallic thin-film layer is set to less than 80% is merely a feature at which a person skilled in the art could arrive through a conventional process of trial and error.

Claim 25

The invention described in claim 25 does not involve an inventive step in the light of documents 1 and 4, for the reasons indicated in the comments pertaining to claims 10 to 13 and claim 16. Further, the feature wherein the percentage of area covered by a metallic thin-film layer is set to less than 80% is merely a feature at which a person skilled in the art could arrive through a conventional process of trial and error.

Claim 26

The invention described in claim 26 does not involve an inventive step in the light of documents 1 and 4 cited in the international search report. Document 4 (fig. 4) discloses a rear projection-type illumination device.

Claim 27

The invention described in claim 27 does not involve an inventive step in the light of document 1 and document 4 cited in the international search report. The invention described in claim 27 differs from the invention disclosed in document 1 in the provision of a protective layer, but the provision of a protective layer in a display device is merely standard practice. Further, the invention described in claim 27 differs from the invention disclosed in document 1 in the arranging of an illumination device that uses the principle of electroluminescence on the rear surface of a retroreflective layer, but document 4 (column 11, line 45 to column 12, line 22, fig. 4) discloses the arranging of an illumination device that uses the principle of electroluminescence on the rear surface of a retroreflective layer.

Claims 28 and 29

The invention described in claims 28 and 29 does not involve an inventive step in the light of documents 1 and 4, for the reasons indicated in the comments pertaining to claims 2 and 3 and claim 27.

Claims 30 and 31

The invention described in claims 30 and 31 does not involve an inventive step in the light of documents 1 and 4, for the reasons indicated in the comments pertaining to claims 4 and 5 and claim 27.

Claim 32

The invention described in claim 32 does not involve an inventive step in the light of documents 1 and 4, for the reasons indicated in the comments pertaining to claim 6 and claim 27. Further, the feature wherein the

percentage of area covered by a metallic thin-film layer is set to less than 80% is merely a feature at which a person skilled in the art could arrive through a conventional process of trial and error.

Claim 33

The invention described in claim 33 does not involve an inventive step in the light of documents 1 and 4. Cube-corner prism-type retroreflective elements such as triangular pyramid-type cube-corner elements or full cube-type cube-corner elements are merely conventionally known elements, as disclosed in document 5.

Claim 34

The invention described in claim 34 does not involve an inventive step in the light of documents 1 and 4, for the reasons indicated in the comments pertaining to claim 7 and claim 27.

Claim 35

The invention described in claim 35 does not involve an inventive step in the light of documents 1 and 4, for the reasons indicated in the comments pertaining to claim 8 and claim 27. Further, the feature wherein the percentage of area covered by a metallic thin-film layer is set to less than 80% is merely a feature at which a person skilled in the art could arrive through a conventional process of trial and error.

Claim 36

The invention described in claim 36 does not involve an inventive step in the light of documents 1 and 4, for the reasons indicated in the comments pertaining to claims 10 to 13 and claim 27. Further, the feature wherein the percentage of area covered by a metallic thin-film layer

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is set to less than 80% is merely a feature at which a person skilled in the art could arrive through a conventional process of trial and error.

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

The phrase "denshi ninshiki souchi" [Japanese for "electron recognition device"] used in claim 14 is a typographical error for "denpa ninshiki souchi" ["electromagnetic wave recognition device"].